Bias in Expected Rates of Return Implied by Analysts' Earnings Forecasts

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1. Introduction

A large and expanding body of literature uses analysts' forecasts of earnings to determine the expected rate of return implied by these forecasts, current book values, and current prices. These implied expected rates of return are often used as estimates of the market's expected rate of return and/or as estimates of the cost of capital.[1] Yet the earnings forecasts are optimistic and are made by sell-side analysts who are in the business of making buy/hold/sell recommendations which are, presumably, based on the difference between their expectation of the future rate of return and the market expectation of this rate of return. If these earnings forecasts are optimistically biased, the expected rates of return implied by these forecasts will be upward biased. We provide an estimate of the extent of this bias.[2]

Consistent with the extant evidence that forecasts (particularly longer-run forecasts) are optimistic, we show that the difference between the expected rate of return implied by analysts' earnings forecasts and the expected rate of return implied by current earnings is, generally, statistically and economically significantly positive. In other words, *ceteris paribus*, studies that use the expected rate of return implied by current prices and these forecasts of earnings have estimates of the cost of capital that may be too high.[3]

The extant literature on analysts' optimism/pessimism generally compares forecasts of earnings with realizations of the earnings that are forecasted. This is an ex post measure of optimism and one that pervades the extant literature. Most of our analysis is a comparison of the expected rate of return implied by analysts' earnings forecasts and the expected rate of return

[1] Cost of capital is an equilibrium concept that relies on the no arbitrage assumption. In the absence of arbitrage opportunities, the markets expected rate of return is equal to the cost of capital.
[2] Claus and Thomas (2001) observe that the optimistic bias in analysts' forecasts will bias their estimate of the equity premium upward.
[3] Examples include Gebhardt, Lee, and Swaminathan (2001), Claus and Thomas (2001), and Easton, Taylor, Shroff, and Sougiannis (2002).

implied by current earnings. This is an ex ante measure of optimism/pessimism. We are primarily interested in this ex ante comparison for two reasons. First, we are interested in whether the use of analysts' forecasts results in biased estimates of expected rates of return. Second, this comparison provides an indication of optimism/pessimism that is not affected by events that occur between the forecast date and the time of the earnings realization.[4]

All of our analyses are based on two methods for simultaneously estimating the expected rate of return and the expected growth rate for a portfolio/group of stocks. The estimate of the expected growth rate is not important in and of itself in our study but estimating it simultaneously with the estimation of the expected rate of return avoids the introduction of error which will almost inevitably arise when the expected growth rate is assumed: any assumed growth rate will almost invariably differ from the growth rate implied by the data.[5]

Our method for estimating the expected rate of return that is implied by prices and current accounting data is an adaptation of the method that O'Hanlon and Steele (2000) use to estimate the expected market equity premium for the U.K. Our method for estimating the expected rate of return that is implied by prices, current book values and forecasts of earnings is an adaptation of the method that Easton, Taylor, Shroff, and Sougiannis (2002) use to estimate the equity premium in the U.S.

The literature that reverse-engineers valuation models to obtain estimates of the expected rate of return on equity investment is very new. These reverse-engineered valuation models include the dividend capitalization model (see, Botosan (1997)), the residual income valuation model (see, O'Hanlon and Steele (2000), Gebhardt, Lee, and Swaminathan (2001), Claus and

[4] An obvious recent example of such an event is the tragedy of the terrorist attack of September 11, 2001. This event, which was not foreseen by analysts, would almost certainly have made their forecasts overly optimistic with the benefit of hindsight. We will return to this example.
[5] See Easton (2005) for a detailed discussion of this source of error.

Thomas (2001), Easton, Taylor, Shroff, and Sougiannis (2002), and Baginski and Wahlen (2003)), and the abnormal growth in earnings model (see, Gode and Mohanram (2003) and Easton (2004)). A literature that has used these estimates to test hypotheses regarding factors that may affect the expected rate of return has developed almost simultaneously (see, for example, Daske (2005), Dhaliwal, Krull, Li, and Moser (2005), Francis, Khurana, and Periera (2005), Francis, LaFond, Olsson, and Schipper (2003), Hail and Leuz (2005), Hribar and Jenkins (2004), and Lee, Myers, and Swaminathan (1999)) This has happened despite the facts that (1) some of these methods were not designed to provide firm-specific estimates (see, in particular, Claus and Thomas (2001), Easton, Taylor, Shroff, and Sougiannis (2002), and Easton (2004)), and (2) there is very little evidence regarding the empirical validity of these methods.

The conclusion from the very recent studies that examine the validity of firm-specific estimates of expected rate of return that are derived from these reverse-engineering exercises (Botosan and Plumlee (2005), Guay, Kothari and Shu (2005), and Easton and Monahan (2005)) is that these estimates are poor, indeed. None of the studies addresses the issue of the difference between the market expectation of the rate of return (which these studies purport to measure) and analysts' expectations. Nevertheless, it is possible that this difference is a correlated omitted variable that could affect the results in studies that compare estimates of the implied expected rate of return on equity capital. It is possible, for example, that analysts' forecasts for firms under one accounting regime (say, accounting based on international accounting standards) may reflect their expectations of larger abnormal returns than analysts' forecasts for firms under a different accounting regime (say, accounting based on domestic standards). These optimistic forecasts will bias the estimate of the expected rate of return upward, potentially leading to the (possibly erroneous) conclusion that the cost of capital is higher for these firms.

In light of analysts' tendency to be optimistic, these estimates of the expected rate of return are likely to be generally higher than the cost of capital.[6] Williams (2004) makes this point in his discussion of Botosan, Plumlee, and Xie (2004). This effect of analysts' optimism is exacerbated by the fact that all studies that use analysts' forecasts to calculate an implied expected rate of return use forecasts that are made well in advance (usually at least a year) of the earnings announcement. These forecasts tend to be much more optimistic than those made closer to the earnings announcement (see Richardson, Teoh, and Wysocki (2004)).

All of our analyses are based on I/B/E/S forecasts of earnings and recommendations for the years 1993 to 2004 and actual prices and accounting data for 1992 to 2004. Consistent with the extant literature, the forecasts tend to be optimistic.

We show that, on average, the estimate of the expected rate of return based on analysts' forecasts is 3.35 percent higher than the estimate that is based on current accounting data. This is not surprising in view of the fact that analysts are in the business of making stock recommendations and their recommendations tend to be "buy" rather than "sell". An implication of the observation that analysts tend to forecast positive abnormal returns is that caution should be taken when interpreting the meaning of the expected rate of return that is implied by analysts' earnings forecasts: it may not be, as the literature generally claims, an estimate of the cost of capital.

The observation that the optimism bias in analysts' forecasts may imply a 3.35 percent upward bias in the estimate of the implied expected rate of return is troublesome. Comparing this bias with the estimates of the expected equity premium based on these data (3 percent or less in Claus and Thomas (2001), between 2 and 3 percent in Gebhardt, Lee, and Swaminathan

[6] While it is reasonable to expect that the level of the analyst's recommendation should be associated with *expected* abnormal returns, it should be noted that Bradshaw (2004) finds analysts' recommendations uncorrelated with future *realized* abnormal returns.

(1999), and 4.8 percent in Easton, Taylor, Shroff, and Sougiannis (2002)) suggests that there is no premium at all! In order to provide some insight into this issue, we estimate the implied expected rates of return for the sub-sample of firms in the S&P 500 index. Arguably, the estimate of the expected rate of return for this sample is more representative of the expected market return that should be used in calculating the equity premium than the estimate based on the entire sample. The reason for this is the fact that each firm, whether a loss-making penny stock that is expected to make losses in the short-run future or a large profitable diversified multi-national, will have a similar contribution to the estimate of the expected rate of return if the full sample is used.[7]

We show that, on average for the our sample of S&P stocks, the estimate of the expected rate of return based on analysts' forecasts is 1.53 percent higher than the estimate that is based on current accounting data. In other words, the optimistic bias for the sample of S&P stocks is much lower than the optimistic bias for all stocks. For this sub-sample, the average (over all of the years) estimate of the expected rate of return is 8.35 percent. This estimate leads to a more reasonable estimate of the expected equity risk premium than the estimate based on the full sample.[8]

Studies such as Michaely and Womack (1999), Boni and Womack (2002), Eames, Glover, and Kennedy (2002), and Bradshaw (2004) show that analysts generally make "strong buy" and "buy" recommendations, sometimes recommending "hold", and rarely recommending "sell". It seems reasonable to expect that buy recommendations will be associated with ex ante optimistic forecasts. In other words, the pervasiveness of buy recommendations may explain the

[7] The weight on each stock in Easton, Taylor, Shroff, and Sougiannis (2002) is the least-squared error regression weight while Claus and Thomas (2001) and Gebhardt, Lee, and Swaminathan (1999) use equal weights when they base their conclusions on means. Estimates based on medians are also affected, possibly to a lesser extent.
[8] The implied estimate of the average expected equity risk premium is 2.71 percent using 10 year Treasury constant maturities (the expected equity risk premium is 4.04 using one year maturities and 4.40 using 3 month maturities).

optimistic bias in expected rates of return based on analysts' forecasts. To examine this issue further, we repeat the analyses for sub-samples formed on the basis of number of analysts comprising the consensus who recommend buy. Contrary to our expectations, we show that the consensus analyst forecast is optimistic even when less than 30 percent of analysts' comprising the consensus recommend buy (and, hence, estimates of the implied expected rate of return are biased upward even for these sub-samples). Interestingly, we show that the implied expected rate of return declines monotonically as the percentage of analysts recommending buy declines. In other words, analysts' recommendations appear to be based on expected rates of return rather than the difference between the analysts' expectations and the market expectation.

The remainder of the paper proceeds as follows. In section 2, we outline the methods used in estimating the expected rate of return implied by market prices, current book value of equity, and current and forecasted accounting earnings. Section 3 describes the data used in our analyses. In section 4 we document the ex post and the ex ante bias in consensus analysts' forecasts and discuss the implications for extant accounting research which is generally based on the entire sample of firms followed by analysts. In section 5, we repeat the analyses for the sub-sample of S&P stocks and show that the estimate of the bias is lower and the estimate of the expected equity risk premium is more reasonable than that obtained in extant studies. Sub-samples based on percentage of analysts' recommending buy are analyzed in section 6. Section 7 concludes with a summary of implications for future research.

2. Methods of estimating the implied expected rate of return

The majority of the analyses in this paper compare estimates of the expected rate of return implied by prices, book value of common equity, and forecasts of earnings (based on the

method in Easton, Taylor, Shroff, and Sougiannis (2002)) with the estimates of the expected rate of return implied by prices, book value of common equity, and realized earnings (based on the method in O'Hanlon and Steele (2000)). The difference is the bias in the estimates of the expected rate of return. Both of the methods are derived from the residual income valuation model which may be written as follows:

$$v_{jt} \equiv bps_{jt} + \sum_{\tau=1}^{\infty} \frac{eps_{jt+\tau} - r_j \times bps_{jt+\tau-1}}{(1+r_j)^{\tau}} \qquad (1)$$

where v_{jt} is the intrinsic value per share of firm j at time t, bps_{jt} is the book value per share of common equity of firm j at time t, eps_{jt} is the earnings per share of firm j at time t and r_j is the cost of capital for firm j.[9] Easton, Taylor, Shroff, and Sougiannis (2002) rely on the following finite horizon version of this model:

$$p_{jt} \equiv bps_{jt} + \frac{eps_{jt+1}^{IBES} - r_j \times bps_{jt}}{(r_j - g_j)} \qquad (2)$$

where p_{jt} is price per share for firm j at time t, eps_{jt+1}^{IBES} is an I/B/E/S forecast of earnings for period t+1, and g_j is the expected rate of growth in residual income beyond period $t+1$ required to equate ($p_{jt} - bps_{jt}$) and the present value of an infinite residual income stream.[10, 11]

Easton, Taylor, Shroff, and Sougiannis (2002), like many other studies, implicitly use analysts' forecasts of earnings as a proxy for market expectations of next period earnings. Optimistic bias in analysts' forecasts implies a bias in this proxy. Optimistic bias in analysts'

[9] Derivation of this model requires the no arbitrage assumption, which is necessary to derive the dividend capitalization formula, and that earnings are comprehensive – in other words, the articulation of earnings and book values is clean surplus.

[10] Price in this relation replaces intrinsic value. This form of the residual income model does not rely on the no-arbitrage assumption – rather it is simply based on the definition of the expected rate of return (the difference between expected cum-dividend end-of-year price and current price divided by current price).

[11] In Easton, Taylor, Shroff, and Sougiannis (2002) the period t to t+1 is 4 years so that eps_{jt+1} is aggregate expected cum-dividend earnings for the four years after date t, that is, $aggearn_{jt+1}/bps_{jt}$. We use a one-year forecast horizon instead of four years in order to facilitate more effective use of the data on analysts' recommendations.

earnings forecasts is well-established in the literature (see, for example, O'Brien (1988), Mendenhall (1991), Brown (1993), Dugar and Nathan (1995), Das, Levine, and Sivaramakrishnan (1998)). Each of these studies estimates the ex post bias by comparing earnings forecasts with realizations. In this paper we use the Easton, Taylor, Shroff, and Sougiannis (2002) method to determine the effect of this ex post forecast error on the estimate of the expected rate of return. We do so by comparing the estimate of the expected rate of return based on I/B/E/S analysts' forecasts with the expected rate of return based on (perfect foresight forecasts of) earnings realizations (that is, we replace eps_{jt+1}^{IBES} in equation (2) with earnings realizations for period $t+1$). Of course, this comparison, like the studies of bias in analysts' forecasts, will be affected by events having an effect on earnings which happen between the time of the forecast and the date of the earnings announcement. Our ex ante analyses used in the majority of this paper are not, however, affected by this information. We compare two ex ante estimates; the estimate of the expected rate of return based on I/B/E/S analysts' forecasts and an estimate based on current accounting data calculated using a method which is a modification of O'Hanlon and Steele (2000).

The method in O'Hanlon and Steele (2000) is based on the following form of the residual income valuation model:

$$p_{jt} \equiv bps_{jt} + \frac{\left(eps_{jt} - r_j \times bps_{jt-1}\right)\left(1 + g'_j\right)}{\left(r_j - g'_j\right)} \qquad (3)$$

A difference between this form of the model and the form used by Easton, Taylor, Shroff, and Sougiannis (2002) is that g'_j is the perpetual growth rate starting from *current residual income* (that is, at time t) that implies a residual income stream such that the present value of that stream is equal to the difference between price and book value, whereas in Easton, Taylor, Shroff, and

Sougiannis (2002), g_j is the perpetual growth rate starting from *next-period residual income* (that is, time $t+1$).

Since eps_{jt} (that is, realized earnings) is the only pay-off used in estimating the implied expected rate of return based on equation (3), this estimate is not affected by analysts' optimism unless that optimism is shared by the market and captured in p_{jt}. Therefore, the estimate based on current accounting data can serve as an estimate of market expectations. It follows that the difference between the estimate of the expected rate of return based on analysts' forecasts (equation (2)) and the estimate based on current earnings (equation (3)) is an estimate of bias introduced when analysts' forecasts are used as an estimate of the markets' expected rate of return.

To summarize, we provide two determinations of the bias when estimates of the market expected rate of return are based on analysts' forecasts of earnings. Each of these methods determines bias as the difference between estimates based on forecasts of earnings and estimates based on earnings realizations. The first ex post measure of bias, based on Easton, Taylor, Shroff, and Sougiannis (2002), compares estimates formed using analysts' forecasts with estimates based on perfect foresight of next-period earnings realizations. The shortcoming of this comparison is that unforeseen events affecting the earnings realizations are omitted from the market price, which is used as the basis for estimating the expected rate of return. The second ex ante measure of bias, compares the estimates based on analysts' forecasts with estimates based on current earnings realizations using the method from O'Hanlon and Steele (2000). The shortcoming of this comparison is that expectations of future events affecting market expectations of earnings are not included in the current accounting earnings but are implicitly included in the market price, which is used as the basis for estimating the expected rate of return.

In other words, market price used in the comparison based in Easton, Taylor, Shroff, and Sougiannis (2002) does not include information which is implicit in the future earnings realization but is unknown at the price-date. On the other hand, market price used in the comparison to the estimate based on O'Hanlon and Steele (2000) includes information that may not be implicit in current earnings realizations. Since there is no obvious reason to expect a correlation between the information excluded from price in the analyses based on equation (2) and the information included in price (but excluded from earnings) in the analyses based on equation (3), we use the results from both methods to gain alternative, independent estimates of the bias. As expected our results are similar using either method.

2.1. Estimation based on prices, book value, and earnings forecasts

Easton, Taylor, Shroff, and Sougiannis (2002) transform equation (2) to form the following regression relation:

$$\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p_{jt}}{bps_{jt}} + \mu_{jt} \qquad (4)$$

where $\gamma_0 = g$, $\gamma_1 = r - g$.[12] This regression may be estimated for any group/portfolio of stocks to obtain an estimate of the implied expected rate of return, *r,* and the implied expected growth rate, *g*, for the portfolio. Easton, Taylor, Shroff, and Sougiannis (2002) run this regression for a sample of U.S. stocks to obtain an estimate of the expected rate of return on the U.S. equity market and hence an estimate of the equity premium for that market. In the empirical implementation of this model, eps_{jt+1} is the I/B/E/S forecast of earnings. Since this is the only

[12] At the firm-specific level, the following relation between the regression variables: $\frac{eps_{jt+1}}{bps_{jt}} = \gamma_{0j} + \gamma_{1j} \frac{p_{jt}}{bps_{jt}}$, is readily obtained by rearranging the identity shown in equation (2). In the re-expression of this relation for a group of observations (as in equation (4)) as a regression relation, the coefficients γ_0 and γ_1 represent an average of the firm-specific γ_{0j} and γ_{1j} coefficients and the cross-sectional variation in these coefficients creates the regression residual. Easton, Taylor, Shroff, and Sougiannis (2002) describe this regression in more detail pointing out that it involves the implicit assumption that it has the properties of a random coefficient regression.

pay-off which is used in the estimation of implied expected rate of return, any bias in the forecast will lead to a bias in the estimate of the expected rate of return.

2.2. Estimation based on current accounting data

O'Hanlon and Steele (2000) transform equation (3) to form the following regression relation:[13]

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - bps_{jt}}{bps_{jt-1}} + \zeta_{jt} \qquad (5)$$

where $\delta_0 = r$, $\delta_1 = (r - g')/(1 + g')$. This regression may be estimated for any group/portfolio of stocks to obtain an estimate of the expected rate of return, *r,* and the expected growth rate, g', for the portfolio. O'Hanlon and Steele (2000) run this regression for a sample of UK stocks to obtain an estimate of the expected rate of return on the UK equity market and hence an estimate of the equity premium for that market. In the empirical implementation of regression (5) eps_{jt} is realized earnings. Since this is the only pay-off used in estimating the implied expected rate of return, this estimate is not affected by analysts' optimism unless that optimism is shared by the market and captured in p_{jt}. It follows that the difference between the estimate of the expected rate of return obtained via regression (4) and the estimate based on regression (5) is an estimate of the bias when analysts' forecasts are used to estimate expected rates of return.

[13] We attribute this model to O'Hanlon and Steele (2000) because they capture its essential elements. The similarity to their model may not, however, be immediately apparent. Since the derivation in O'Hanlon and Steele (2000) is based on Ohlson (1989), the observation that the regression intercept is an estimate of the implied expected rate of return is not evident and O'Hanlon and Steele (2000) do not use it in this way. Rather, they estimate the implied expected rate of return at the firm-specific level by applying their model to time-series data and then measuring the risk premium as the slope of the Securities Market Line estimated from a regression of these firm-specific rates of return on corresponding beta estimates. Notice that, in addition to requiring earnings to be clean surplus in all future periods, this form of the residual income model also requires that the relation between earnings for period *t* and book value for periods *t* and *t*-1 follows the clean surplus relation.

2.3 The relation between prices, actual earnings, and forecasts of earnings

In order to ensure that we obtain an estimate of the analysts' expected rate of return we must use prices in regression (4) which reflect analysts' expectations. Similarly, in regression (5) we must use prices that reflect earnings realizations. The alignment of price-dates, earnings announcement dates, and analysts' forecast-dates is described in this sub-section and summarized in figure 1.

We choose the first consensus forecast announced at least 14 days after the date of the earnings announcement. In our analyses based on these forecasts, we use the price at the close of trade one day after the earnings announcement. Consistent with numerous studies of the information content of earnings, it seems reasonable to assume that this price incorporates the information in realized earnings. Further, we implicitly assume that this price was known to analysts at the time they formed their earnings forecasts. In view of the fact that the forecasts comprising the consensus are formed at various points in time, this assumption may be invalid because some of the forecasts comprising the consensus may precede the earnings announcement date or they may have been issued a considerable time after this date. We examine the sensitivity of the results to this assumption by varying the price-date from the day after the earnings announcement to one day after the consensus forecast is measured. This latter measurement date for price allows for the incorporation of the information in the analysts' forecasts in price. The results are not sensitive to this choice. We will return to this point.

The focus of most of our analyses is on the difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate of expected rate of return based on current earnings realizations. This focus motivates our choice of the date on which we gather the price data. We note, however, that most of the literature determines

expected rates of return implied by forecasts of earnings and prices that take these forecasts into account (that is, prices measured after the forecast). The difference between the implied expected rates of return based on analysts' forecasts and based on current accounting data and prices after the forecast is arguably an estimate of the bias introduced by using analysts' forecasts as estimates of the market expectation of the rate of return (as in most of the extant literature). We show that our conclusions are unchanged whether we use prices after the analysts' forecast date or prices before these forecasts are made public. Hence, our conclusion regarding the difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate of expected rate of return based on earnings realizations and prices before the forecast (arguably the analysts' expected abnormal returns) also apply to the difference between estimates of the expected rate of return based on earnings realizations and estimates of expected rates of return based on analysts' forecasts and prices that take these forecasts into account (arguably bias).

The residual income valuation model underlying regressions (4) and (5) describes the value of a stock at the fiscal period end-date. Our analyses are based on prices after this date. To accommodate this difference, we replace price (p_{jt}) in equations (4) and (5) with price at the dates described above discounted by the expected rate of return ($\hat{r}$) back to the fiscal year end (that is, $p_{jt} \big/ (1+\hat{r})^{\tau/365}$), where τ is the number of days between the fiscal year end and the price-date). Since the discounting of price requires the expected rate of return we are attempting to estimate in equations (4) and (5), we use an iterative method (as in Easton, Taylor, Shroff, and Sougiannis (2002)). We begin these iterations by assuming a discount rate for prices of 12 percent. We run each regression and obtain estimates of the expected rate of return which we then use as the new rate for discounting prices. We then re-run the regressions to re-estimate

equation (4) and/or equation (5) and provide another estimate of expected return. This procedure is repeated until the expected return and the rate used in discounting price converge.[14]

3. Description of the data

All earnings forecast and recommendation data are obtained from the I/B/E/S unadjusted research databases. We use the first median consensus forecast of earnings for year $t+1$ released 14 days or more after the announcement of earnings for year t. This forecast is released on the third Thursday of each month. These data are obtained from the I/B/E/S Summary database. "Actual" earnings are also obtained from this database. The first year of our analyses uses forecasts and recommendations from 1993 in order to ensure the dates of the individual analysts' forecasts are reliable.[15]

Book value of common equity and common shares outstanding are obtained from the CRSP/COMPUSTAT annual merged database.[16] Prices are obtained from the CRSP daily price file.

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[14] This iterative process is repeated until none of the annual estimates changes by more than 0.00001%. In our samples, the annual estimates usually converged in 5-6 iterations. This iterative procedure is not sensitive to choices of beginning discount rates between five and 20 percent.

[15] Zitzewitz [2002, p. 16] describes the importance of not relying on forecast dates in the I/B/E/S database prior to 1993 as follows:

> "I/B/E/S dates forecasts using the date it was entered into the I/B/E/S system. It has been well documented (e.g., by O'Brien, 1988) that the lags between a forecast becoming public and its entry into the I/B/E/S system were substantial in the 1980s (i.e., up to a month). In the 1980s, analysts mailed their forecasts, often in monthly batches, to I/B/E/S where they were hand entered into the system. Since 1991-92, however, almost all analysts have entered their forecasts directly into the I/B/E/S system on the day they wish to make their forecast widely available (Kutsoati and Bernhardt, 1999). Current practice for analysts is now usually to publicly release forecasts within 24 hours of providing them to clients. I/B/E/S analysts have real-time access to each other's forecasts through this system, so an analyst entering a forecast into the system on Wednesday knows about forecasts entered on Tuesday and could potentially revise her forecast to incorporate their information. An additional advantage of the post-92 data is the shift from retrospective data entry by a specialist to real-time data entry by either the analyst or her employee should have considerably reduced data-entry related measurement error."

[16] In order to ensure that the clean-surplus assumption required for the derivation of the residual income valuation model holds in the data for fiscal year t, contemporaneous book value in regression (5) – that is, b_{jt} – is calculated as Compustat book value of common equity minus Compustat net income plus I/B/E/S actual income. That is, we use the book value number that would have been reported if the (corresponding) income statement had been based on

We delete firms with non-December fiscal-year end so that the market implied discount rate and growth rate are estimated at the same point in time for each firm-year observation. For each set of tests, firms with any of the dependent or independent variables for that year in the top or bottom one percent of observations are removed to reduce the effects of outliers.

4. Ex post and ex ante bias in analysts' consensus forecasts

We begin by documenting the accuracy (that is, the mean/median *absolute* earnings forecast error) and the ex post bias (that is, the mean/median earnings forecast error) in the earnings forecasts for the entire sample of stocks. Second, we compare the estimate of the expected rate of return implied by prices, book values, and analysts' forecasts of earnings with the estimate obtained from prices, book values, and actual current earnings. This is an estimate of ex ante bias and also an estimate of the bias in estimates of the expected rate of return in the extant literature.

4.1. Accuracy and bias in the analysts' forecasts of earnings

Table 1 summarizes the accuracy and the ex post measure of bias in the I/B/E/S consensus forecast of earnings measured in each of the years 1992 to 2003.

We use the mean (median) absolute forecast error as the measure of accuracy. The mean absolute forecast error ranges from \$0.429 in 1994 to \$1.340 in 2000 and the median absolute forecast error ranges from \$0.150 in 2002 to \$0.300 in 2000. In order to give some indication of the scale of these errors, we also present the mean and the median absolute forecast error deflated by end-of-year price. The mean absolute price-deflated forecast error ranges from 0.021

I/B/E/S actual earnings. We also remove year *t* dirty surplus items from Compustat book value. These adjustments are unnecessary for the book value variable in regression (4) because the clean-surplus assumption only refers to future income statements and balance sheets.

in 2003 to 0.065 in 2000 and the median absolute price-deflated forecast error ranges from 0.009 in 1993 and 2003 to 0.019 in 2000.

We use the mean (median) forecast error as the measure of the ex post bias in the analysts' forecasts. The mean forecast error ranges from -$1.188 in 2000 to $0.094 in 2002 and the median forecast error ranges from -$0.220 in 2000 to -$0.010 in 2003. The mean price-deflated forecast error ranges from -0.049 in 2000 to -0.003 in 2003 and the median price-deflated forecast error ranges from -0.011 in 2000 to -0.001 in 2003. These predominantly negative forecast errors are consistent with the prior literature, which concludes that analysts' forecasts, particularly long-run forecasts, tend to be optimistic (see, for example, O'Brien (1993), Lin (1994), and Richardson, Teoh, and Wysocki (2004)). As noted earlier, these forecast errors compare forecasts with ex post realizations. In later analyses we will compare these ex post forecast errors with forecast errors determined ex ante.

4.2. Description of regression variables

The number of observations used to estimate the annual regressions ranges from 1,554 at December 1992 to 2,317 at December 1997. As shown in table 2, the mean price-to-book ratio, which is the independent variable in regression (4) ranges from 2.028 at December 2002 to 3.974 at December 1999 while the median price-to-book ratio ranges from 1.620 at December 2002 to 2.418 at December 1997. This regression is run with the forecasted return-on-equity based on the I/B/E/S consensus forecast as the dependent variable. The mean forecasted return-on-equity ranges from 0.067 at December 2001 to 0.141 at December 1994 and 1995 and the median forecasted return-on-equity ranges from 0.106 at December 2001 to 0.143 at December 1994.

The annual mean and median current return-on-equity (the dependent variable in regression (5)) is generally a little less than the corresponding mean and median forecasted

return-on-equity. The mean current return-on-equity ranges from 0.055 at December 2001 to 0.115 at December 1994 and 1995 and the median current return-on-equity ranges from 0.095 at December 2001 to 0.130 at December 1995. The mean of the independent variable in this regression (the difference between price and current book value deflated by lagged book value) ranges from 1.075 at December 2002 to 3.369 at December 1999 and the median ranges from 0.653 at December 2002 to 1.490 at December 1997.

4.3. Comparison of implied expected rates of return based on I/B/E/S forecasts of earnings with implied expected rate of return based on current accounting data

In this section, we compare the estimates of the implied expected rates of return using the method in Easton, Taylor, Shroff, and Sougiannis (2002) using one-year ahead I/B/E/S consensus forecasts of earnings (regression (4)) with the estimates obtained from the method in O'Hanlon and Steele (2000) which is based on current earnings and current and lagged book value (regression (5)). The estimates based on analysts' forecasts include the analysts' estimate of both the normal and the abnormal expected rate of return while the estimates based on actual current accounting data provide an indication of the market's expected rate of return. Arguably, the difference between the two estimates is the analysts' estimate of abnormal return that would accrue from investing in the stock and should provide a basis for their stock recommendation. We also compare the estimates based on analysts' forecasts to those implied by future earnings realizations; that is, by perfect foresight forecasts.

4.3.1. The expected rate of return implied by analysts' earnings forecasts

The summary statistics from regression (4) where the dependent variable is I/B/E/S forecasted return-on-equity are included in panel A of table 3. We provide year-by-year estimates of the regression coefficients and t-statistics for tests of their difference from zero. Since these t-statistics may be over-stated due to the possibility of correlated residuals, we also

present the mean coefficient estimates and the related Fama and MacBeth (1973) t-statistics. The regression adjusted R^2 ranges from 0.01 percent at December 2003 to 24.15 percent at December 1992.[17] The mean estimate of the intercept coefficient $\gamma_{0,}$ which is an estimate of the implied growth in residual income beyond the one-year forecast horizon, is 0.081 (t-statistic of 9.43) and the mean estimate of the slope coefficient $\gamma_{1,}$ which is an estimate of the difference between the implied analysts' expected rate of return and the implied growth in residual income beyond the one-year forecast horizon, is 0.013 (t-statistic of 3.80).

The estimates of the implied expected rate of return obtained from the estimates of the regression (4) coefficients where the dependent variable is analysts' forecasts of return-on-equity, are also included in panel A of table 3. These estimates range from 4.69 percent at December 2001 to 13.04 percent at December 1999 with a mean (t-statistic) of 9.45 percent (13.60).[18]

4.3.2. The expected rate of return implied by current accounting data

The summary statistics from regression (5) are also included in panel A of table 3. The regression adjusted r-square ranges from 0.13 percent at December 2003 to 23.73 percent at

[17] We note the very low r-square in some of these regressions. As a result we performed several analyses of the effects of outliers. When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the explanatory power of these regressions increases such that the range is from a low of 0.39 percent at December 1999 to a high of 37.73 percent at December 1992. When we perform more severe outlier removal – for example, removing the top and bottom 20 percent of observations or by eliminating all observations with an R-student statistic greater than 2 -- the regression r-square increases but none of our inferences based on the resulting estimates of the implied expected rate of return change. We also perform all analyses on the sub-set of observations for which analysts forecast positive earnings. Again we obtain much higher r-squares but inferences remain unchanged. These further analyses of outliers are also performed on all subsequent regressions and, in all cases, our inferences are unchanged. In order to provide an indication of the effect of the effect of outliers, we report some relevant statistics throughout the paper. When we repeat regression (4) for the sub-sample of observations for which analysts forecast positive earnings, the explanatory power of these regressions increases such that the range is from a low of 16.60 percent at December 1999 to a high of 52.55 percent at December 2002.

[18] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the estimates of the implied expected rates of return range from range from 5.64 percent at December 2002 to 13.01 percent at December 1999 with a mean (t-statistic) of 9.67 percent (15.90). When we repeat regression (4) for the sub-sample of observations for which analysts forecast positive earnings the estimates of the implied expected rates of return range from range from 9.59 percent at December 2003 to 14.23 percent at December 1999 with a mean (t-statistic) of 11.31 percent (27.22).

December 1992.[19] The mean estimate of the intercept coefficient $\delta_{0,}$ which is an estimate of the implied expected rate of return, is 0.061 (t-statistic of 8.90) and the mean estimate of the slope coefficient $\delta_{1,}$ which is a function of the expected rate of return and the expected growth in residual income, is 0.018 (t-statistic of 4.10). The estimates of the implied expected rate of return are also included in panel A of table 3. These estimates range from 1.97 percent at December 2001 to 9.74 percent at December 1999 with a mean (t-statistic) of 6.10 percent (8.90).[20]

4.3.3. The difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate of the expected rate of return based on current accounting data

Differences between the estimates of expected rate of return based on regressions (4) and (5) are included in the last column of panel A of table 3. On average, the difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate of the expected rate of return based on earnings realizations is 3.35 percent (t-statistic of 15.07) but there are some years when it is quite large (for example, for the sample of stocks at December 1994, the difference is 4.77 percent). These results are not surprising in view of the fact that analysts' are in the business of making stock recommendations and their recommendations tend to be "buy" rather than "sell".

An implication of the observation that analysts tend to forecast higher rates of return is that caution should be taken when interpreting the meaning of the rate of return that is implied by

[19] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the explanatory power of these regressions increases such that the range is from a low of 0.17 percent at December 1999 to a high of 27.11 percent at December 1992. For the sub-sample of observations for which analysts forecast positive earnings, the explanatory power of these regressions increases such that the range is from a low of 9.46 percent at December 1999 to a high of 44.57 percent at December 1994.

[20] When we remove the top and bottom three percent of observations (rather than the top and bottom one percent) the estimates of the implied expected rates of return range from range from 2.88 percent at December 2002 to 9.73 percent at December 1999 with a mean (t-statistic) of 6.76 percent (11.11). For the sub-sample of observations for which analysts forecast positive earnings, the estimates of the implied expected rates of return range from 6.60 percent at December 1992 to 11.90 percent at December 1999 with a mean (t-statistic) of 9.05 (21.44).

analysts' earnings forecasts: if, as is often the case in the extant literature, it is used as an estimate of the cost of capital, it is likely upward biased.

4.3.4. Estimates of the expected rate of return based on perfect foresight forecasts

The results in section 4.3.3 are roughly consistent with the results in Table 1 which show that the ex post forecast error is generally negative. For example, we saw, in Table 1 that the mean deflated forecast error is -0.022. A crude PE valuation model which relies on full payout and earnings following a random walk suggests that the price-to-forward-earnings ratio is equal to the inverse of the expected rate of return. Thus a deflated forecast error of -0.022 implies an error in the expected rate of return of 2.2 percent. Allowing for the conservative nature of accounting (as in the models used in the ex ante indicators of optimism in panel A of table 3) leads to the conclusion that these estimates are at least "in the same ball-park".

Alternatively, the ex post forecast error can be re-parameterized as an error in the implied expected rate of return. This error may be estimated as the difference between the implied expected rate of return based on regression (4) where expected earnings are I/B/E/S forecasts (as in panel A of table 3) and the implied expected rate of return when these expected earnings are replaced in this regression with realized earnings for year $t+1$. The results of estimating the implied expected rate of return using realized earnings as "perfect foresight" forecasts are reported in panel B of table 3. Using perfect foresight earnings, the estimates of expected rate of return range from 2.81 percent at December 2001 to 9.81 percent at December 1999 with a mean (t-statistic) of 6.45 percent (8.99). Comparing the perfect foresight forecast to the consensus forecasts the mean bias is 3.00 percent (t-statistic of 7.08).

The two estimates of expected rate of return that are not expected to contain bias (that is, those based on perfect foresight earnings and current accounting data) yield similar results. The

difference of -0.35 percent is not significantly different from zero (t-statistic of -0.76). As expected our results are similar using either method. That is, both methods yield alternative, independent estimates of the bias that are not significantly different.

4.3.5. Effects of altering the timing of price measurement

As mentioned in section 2.3, in our primary analyses we use price measured after the release of the prior year earnings but before analysts' forecast revisions. Table 3, panel C summarizes the results of the analysis summarized in panels A and B of table 3, but using prices measured at close of trade on the day after the consensus forecast is measured. This price is at least 14 days (and could be a month and a half) after the price used in panels A and B. We assume that this price reflects the information in the analysts' forecasts. Comparison of panels A and C reveals that the measurement of price at differing points (and, therefore, differing periods for discounting of price back to fiscal year-end) has no statistically or economically significant effect. The primary result from panel A of table 3 of an average 3.35 percent difference between the analysts' and market's expected rate of return is virtually unchanged at 3.39 (un-tabulated t-statistic of 14.94) when price is measured at the day after the consensus forecast is measured.[21]

5. Restriction of sample to those firms in the S&P 500

In panel A of table 3, the mean expected rate of return using current accounting data is 6.10 percent. This estimate implies a very small risk premium. In fact, the two lowest estimates of 1.97 percent at December 2002 and 2.02 percent at December 2001 imply virtually no risk premium. To examine this further, we restrict the sample to those firms in the S&P 500 with sufficient data at the time of estimation (and December year-end) and repeat the analyses. Since

[21] The results are virtually identical if we use prices taken from any date ranging from one day after the earnings announcement date to one day after the forecast announcement date (the set of *s* price-dates shown in Figure 1).

these firms are a representative of larger firms in the US economy, they should provide a better proxy for the risk premium.

The S&P 500 sub-sample results are summarized in table 4. In panel A of table 4 we see that the mean and median scaled absolute forecast errors (0.017 and 0.007) are approximately half the errors for the full sample (0.037 and 0.012). Also, the mean and median ex post forecast bias for this sub-sample is much lower (-0.008 and -0.002 compared with -0.022 and -0.005).

The results from the estimation of regressions (4) and (5) for the S&P 500 sub-sample of stocks are summarized in panel B of table 4. A notable difference between these regression results and the results for the entire sample (see panels A and B of table 3) is the higher adjusted r-square for the S&P sub-sample (for example, the average adjusted r-square for the regression (4) based on analysts' consensus forecast is 67.08 percent for the S&P 500 sub-sample whereas it is 5.07 percent for the entire sample). As expected, t-statistics on the slope coefficient for these regressions are also higher for the S&P 500 sub-sample.

The mean estimates (t-statistic) of the expected rate of return, also reported in panel B of table 4, are 9.88 percent (16.87) using analysts' forecasts, 8.35 percent (11.74) using current accounting data, and 8.83 percent (12.12) using perfect foresight forecasts. The (un-tabulated) minimum expected rate of return estimated using current accounting data is 5.18 percent at December 2001 and the (tabulated) average of 8.35 percent yields a more reasonable estimate of the risk premium than the full sample.

Differences between the estimates are reported in panel C of table 4. The ex ante bias in the estimates using analysts' forecasts, though smaller in the S&P 500 sample than in the entire sample (1.53 percent compared with 3.35 percent), is still significantly positive. As in the full

sample, the difference between our ex ante and ex post unbiased estimates is insignificant (-0.48 percent).

6. Variation in the implied expected rate of return with changes in the percentage of analysts making "buy" recommendations

Having documented a bias in the estimates of the expected rate of return based on analysts' forecasts of earnings, we now examine how the bias varies across analysts' recommendations. It is well documented that analysts seldom issue "sell" recommendations. To the extent that our samples examined thus far contain a majority of firms with "buy" recommendations, the observed positive bias in the expected rate of return using analysts' forecasts may only be capturing the analysts' expectation of the abnormal returns, which can be earned from these stocks. To test this, the remainder of the analyses will focus on estimating the expected rate of return for groups of firms with varying recommendations.

6.1 Sample description

I/B/E/S provides data on the percentage of analysts whose forecasts comprise the consensus who also make either a "strong buy" or a "buy" recommendation. We repeat the analyses in section 4.3 for sub-samples with various percentages of these types of forecasts. Descriptive statistics are provided in table 5, panel A. The choice of the five partitions of the data was based on a desire to maintain a sufficient number of observations to provide reasonable confidence in the regression output in each year. We restrict the sample to those consensus forecasts which are comprised of at least 5 analysts so that it is possible for a firm to appear in any of the partitions.

The mean and median forecast error is always negative (that is, analysts are optimistic) regardless of the percentage of buy recommendations in the consensus. For example, the median

deflated forecast error is -0.004 when the percentage of buy recommendations is greater than 90 percent, between 30 and 50 percent, and less than 30 percent.

Both the return-on-equity and the price-to-book ratio tend to be higher for the observations where there are more "buy" recommendations comprising the consensus. For example, the median forecasted return-on-equity for the sub-samples where greater than 90 percent of the analysts recommend buy and where between 70 and 90 percent recommend buy is 0.156 and 0.161 while median forecasted return-on-equity for the sub-sample where less than 30 percent of the analysts recommend buy is 0.111; the median price-to-book ratio for the sub-samples where greater that 90 percent of the analysts recommend buy and where between 70 and 90 percent recommend buy is 2.962 and 2.717 while median price-to-book ratio for the sub-samples where less than 30 percent of the analysts recommend buy is 1.660.

6.2 Estimates of implied expected rates of return

The results from the estimation of regression (4) based on price, I/B/E/S forecasts of earnings, and current book value and from the estimation of regression (5) based on price and current accounting data and are summarized in table 5, panel B. We focus our discussion on the estimates of the implied expected rates of return obtained from these regression parameters. These estimates are also included in panel B.

The estimates of the expected rates of return implied by I/B/E/S analysts' forecasts decline monotonically with the percentage of buy recommendations associated with the forecasts of earnings comprising the consensus (the means of these estimates are 12.61 percent, 11.42 percent, 10.42 percent, 8.20 percent, and 5.63 percent) suggesting that analysts' recommendations are, indeed, consistent with their expectations of rates of return. The estimates of the expected rates of return based on prices and current accounting data show a pattern that is

very similar to that of those based on analysts' forecasts: the mean estimates of the expected rate of return for each of the groups of data also decline monotonically (the means of these estimates are 9.91 percent, 9.24 percent, 8.60 percent, 6.32 percent, and 4.05 percent).

Differences between the estimates of expected rate of return based on percentage of buy recommendations are included in table 5, panel C. Comparing the expected rates of return based on prices and current accounting data with the estimates based on analysts' forecasts reveals that even the analysts who tend not to recommend buy tend to be estimating a rate of return that is higher than expectations based on current accounting data (these mean differences between the estimates based on analysts' forecasts and estimates based on current accounting data are 2.70 percent, 2.18 percent, 1.82 percent, 1.89 percent, and 1.58 percent). Three of these differences are significant. This pervasive optimism about the expected return measured by comparing analysts' expectations with expectations based on current accounting data is, interestingly, quite similar to the optimism observed by comparing expectations of future earnings with actual realizations of earnings (see table 5, panel A).

6.3 Analysis of percentage of "buy" recommendations for the S&P 500 sample

We repeat the comparisons across varying degrees of buy recommendations for the sub-sample of S&P 500 stocks. The results are summarized in Table 6. Descriptive statistics are provided in table 6, panel A. The choice of the four partitions of the data is, again, based on a desire to maintain a sufficient number of observations to provide reasonable confidence in the regression output in each year. Again, we restrict the sample to those consensus forecasts which are made by at least 5 analysts.

The mean and median forecast errors are, again, always negative (that is, analysts are optimistic) regardless of the percentage of buy recommendations in the consensus (the median

deflated forecast error is -0.002 for all sub-samples) and, again both the return-on-equity and the price-to-book ratio tend to be higher for the observations where there are more "buy" recommendations comprising the consensus.

The results from the estimation of regression (4) based on price, I/B/E/S forecasts of earnings, and current book value and from the estimation of regression (5) based on price and current accounting data for the S&P sub-sample are summarized in table 6, panel B. The estimates of the expected rates of return implied by I/B/E/S analysts' forecasts decline monotonically with the percentage of buy recommendations associated with the forecasts of earnings comprising the consensus (the means of these estimates are 12.35 percent, 11.06 percent, 8.25 percent, and 7.48 percent) and the estimates based on current accounting data decline almost monotonically (the means of these estimates are 10.99 percent, 9.80 percent, 8.60 percent, 6.55 percent, and 7.01 percent).

Differences between the estimates of expected rate of return based on percentage of buy recommendations are included in table 6, panel C. As with the entire sample, a comparison of the expected rates of return based on prices and current accounting data with the estimates based on analysts' forecasts reveals that even the analysts who tend not to recommend buy tend to be estimating a rate of return that is higher than expectations based on current accounting data (these mean differences between the estimates based on analysts' forecasts and estimates based on current accounting data are 1.36 percent, 1.25 percent, 1.70 percent, and 0.47 percent), although only the 1.70 percent difference is significant at the 5 percent level.

6.4 Summary

To summarize the analyses in this section; we observe that analysts' recommendations are consistent with their expectations of returns (that is, there is a monotonic decrease in

expected rate of return as the percentage of buy recommendations declines) and that analysts' expected rate of return is higher than expectations based on current accounting data regardless of their recommendation. An interpretation of this result is that analysts are always more optimistic than the market even when they are not issuing buy recommendations.[22] The bias in expected rates of return based on analysts' forecasts is not the result of positive abnormal returns isolated in firms with "buy" or "strong buy" recommendations.

7 Summary and conclusions

We show that, on average, the estimate of the difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate of based on current earnings realizations is 3.35 percent and there are some years when it is quite large (for example, for the sample of stocks at December 1994, the estimate of the difference is 4.77 percent). An implication of the observation that analysts tend to forecast rates of return that are higher than market expectations is that caution should be taken when interpreting the meaning of the rate of return that is implied by analysts' earnings forecasts: it may not be, as the literature generally claims, an estimate of the cost of capital.

When estimates of the expected rate of return in the extant literature are adjusted for this bias, the estimate of the equity risk premium is zero. We show, however, when estimates are based on a more representative sample of stocks (the S&P 500), the bias in the estimate of the expected rate of return is lower and the estimate of the expected equity premium is more reasonable (2.71 percent).

[22] This result is consistent with Barber, Lehavy, McNicholls, and Trueman (2001) who show that analysts' recommendations (in their case, those summarized in the Zach's database) can not be used to form profitable trading strategies.

Results from sub-samples formed on the basis of percentage of analysts comprising the consensus recommending "buy", show that the estimate of the expected rate of return based on both analysts' forecasts of earnings and on current earnings decline monotonically as the percentage of analysts recommending buy declines. Nevertheless, a comparison of the estimates of the expected rate of return based on the analysts' forecasts with estimates based on earnings realizations suggests that analysts tend to be more optimistic than the market even when they are not making "buy" recommendations. That is, analysts recommend "buy" when they expect the future return to be high and "sell" when they expect the return to be low, regardless of market expectations.

Our paper has two key implications for future research which uses market price, book value of equity and accounting earnings to obtain estimates of the implied expected rate of return for a portfolio of stocks. First, since analysts' forecasts are pervasively optimistic, estimates of the implied expected rate of return formed using forecasts will be pervasively and significantly upward biased. This bias may be avoided by estimating the rate of return implied by price, book values and realized earnings (rather than biased earnings forecasts). Second, representative samples, such as the S&P 500 provide more realistic estimates of the expected rate of return than are implied by larger samples, which may be unnecessarily affected by less representative observations (such as penny stock) and stock making losses.[23]

[23] The interpretation of "representative" depends on the question being addressed. It seems reasonable to suggest that the S&P 500 stocks are a representative sample if the focus is on estimating the market equity premium. However, if, for the sake of argument, the emphasis is on the implied expected rate of return on penny stocks, the sample would be limited to these stocks.

Figure 1: Alignment of Price-Dates, Earnings Announcement Dates, and Analysts' Forecast-Dates

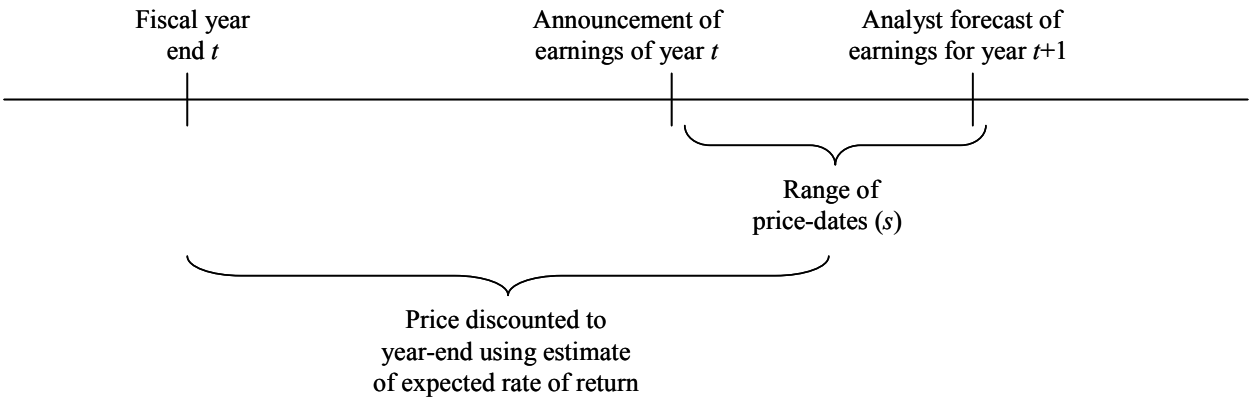

Table 1: Descriptive statistics on forecast errors for the consensus sample

		Accuracy of forecasts				Bias in forecasts			
		$\lvert FE_{jt+1} \rvert$		$\lvert FE_{jt+1} \rvert / p_{jt}$		FE_{jt+1}		FE_{jt+1} / p_{jt}	
t	N	Mean	Median	Mean	Median	Mean	Median	Mean	Median
12/92	1,554	0.583	0.275	0.033	0.014	-0.246	-0.140	-0.019	-0.007
12/93	1,670	0.465	0.190	0.029	0.009	-0.234	-0.065	-0.020	-0.003
12/94	1,927	0.429	0.220	0.034	0.012	-0.207	-0.080	-0.020	-0.004
12/95	2,107	0.457	0.210	0.032	0.011	-0.266	-0.080	-0.022	-0.004
12/96	2,205	0.518	0.220	0.029	0.011	-0.203	-0.100	-0.019	-0.005
12/97	2,317	0.604	0.280	0.034	0.014	-0.373	-0.200	-0.026	-0.009
12/98	2,237	0.692	0.210	0.043	0.012	-0.485	-0.070	-0.024	-0.004
12/99	2,041	0.649	0.230	0.047	0.013	-0.387	-0.080	-0.029	-0.004
12/00	1,948	1.340	0.300	0.065	0.019	-1.188	-0.220	-0.049	-0.011
12/01	2,002	0.678	0.190	0.036	0.011	0.035	-0.050	-0.019	-0.002
12/02	2,045	0.548	0.150	0.038	0.011	0.094	-0.030	-0.016	-0.002
12/03	2,201	0.624	0.170	0.021	0.009	-0.230	-0.010	-0.003	-0.001
Means	2,021.17	0.632	0.220	0.037	0.012	-0.308	-0.094	-0.022	-0.005

Notes to Table 1:

FE_{jt+1} is actual earnings per share for year t+1 as reported by I/B/E/S less the first median consensus forecast of earnings per share for year t+1 released at least 14 days after the announcement of year t earnings

p_{jt} is price per share as of the end of fiscal year t

Table 2: Summary statistics for regression variables

		$\frac{eps_{jt+1}^{Cons}}{bps_{jt}}$		$\frac{eps_{jt}}{bps_{jt-1}}$		$\frac{p'_{jt}}{bps_{jt}}$		$\frac{p'_{jt} - bps^{*}_{jt}}{bps_{jt-1}}$	
		Equation (4) dependent variable		*Equation (5) dependent variable*		*Equation (4) independent variable*		*Equation (5) independent variable*	
t	N	Mean	Median	Mean	Median	Mean	Median	Mean	Median
12/92	1,554	0.133	0.130	0.097	0.109	2.252	1.793	1.332	0.854
12/93	1,670	0.134	0.137	0.106	0.120	2.487	1.949	1.613	1.008
12/94	1,927	0.141	0.143	0.115	0.124	2.199	1.717	1.429	0.828
12/95	2,107	0.141	0.141	0.115	0.130	2.583	1.918	1.849	1.068
12/96	2,205	0.130	0.138	0.098	0.123	2.793	2.115	2.006	1.224
12/97	2,317	0.116	0.139	0.092	0.123	3.153	2.418	2.266	1.490
12/98	2,237	0.106	0.133	0.085	0.112	2.901	1.973	1.961	0.951
12/99	2,041	0.106	0.138	0.075	0.121	3.974	1.929	3.369	1.058
12/00	1,948	0.099	0.132	0.081	0.123	2.937	1.962	2.202	1.089
12/01	2,002	0.067	0.106	0.055	0.095	2.586	1.927	1.649	0.979
12/02	2,045	0.079	0.113	0.065	0.096	2.028	1.620	1.075	0.653
12/03	2,201	0.094	0.119	0.072	0.106	3.099	2.336	2.497	1.460
Means	2,021.17	0.112	0.131	0.088	0.115	2.749	1.971	1.937	1.055

Notes to Table 2:

eps_{jt+1}^{Cons} is the first median consensus forecast of earnings per share for firm *j* for year *t*+1 released at least 14 days after the announcement of year *t* earnings

eps_{jt} is the I/B/E/S actual earnings per share for firm *j* for year *t*

bps_{jt} is common book value of equity per share for firm *j* at time *t*

$p'_{jt} = \frac{p_{j\tau}{}^{*}}{(1+\hat{r})^{\tau/365}}$ is the price per share for firm *j* at time τ (one day after the earnings announcement date), p^{*}_{jt}, adjusted for stock splits and stock dividends since the end of the fiscal year, discounted to year end using the estimated discount rate

bps^{*}_{jt} is the common book value of equity per share for firm *j* at time *t* less net income for firm *j* for year *t* plus I/B/E/S actual earnings per share for firm *j* for year *t*

Table 3: Comparison of implied expected rates of return based on I/B/E/S forecasts of earnings with implied expected rate of return based on current accounting data

Panel A: Estimates of expected rate of return based on analysts' forecasts and current accounting data

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p'_{jt} - bps^{*}_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts				Current accounting data				Difference in expected rate of return
t	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$	
12/92	1,554	0.056	0.034	24.15%	9.04%	0.048	0.037	23.73%	4.76%	4.28%
		(13.84)	(22.26)			(13.57)	(22.01)			
12/93	1,670	0.076	0.023	9.83%	9.95%	0.063	0.026	11.66%	6.31%	3.64%
		(14.79)	(13.52)			(14.76)	(14.88)			
12/94	1,927	0.082	0.027	9.08%	10.89%	0.061	0.038	22.15%	6.12%	4.77%
		(16.14)	(13.90)			(16.53)	(23.43)			
12/95	2,107	0.110	0.012	2.99%	12.21%	0.091	0.013	3.66%	9.06%	3.15%
		(23.02)	(8.12)			(19.84)	(8.99)			
12/96	2,205	0.096	0.012	2.91%	10.82%	0.078	0.010	1.74%	7.84%	2.98%
		(18.52)	(8.19)			(15.73)	(6.33)			
12/97	2,317	0.090	0.009	1.26%	9.81%	0.058	0.015	4.33%	5.78%	4.03%
		(14.45)	(5.52)			(11.38)	(10.29)			
12/98	2,237	0.086	0.007	0.78%	9.31%	0.060	0.013	4.42%	5.95%	3.36%
		(13.37)	(4.31)			(12.93)	(10.22)			
12/99	2,041	0.139	-0.008	4.73%	13.04%	0.097	-0.007	3.95%	9.74%	3.30%
		(23.79)	(-10.11)			(17.55)	(-9.22)			
12/00	1,948	0.087	0.004	0.31%	9.15%	0.071	0.004	0.36%	7.13%	2.02%
		(13.31)	(2.67)			(11.46)	(2.83)			
12/01	2,002	0.035	0.012	1.73%	4.69%	0.020	0.021	6.27%	2.02%	2.67%
		(5.10)	(6.01)			(4.01)	(11.61)			
12/02	2,045	0.032	0.023	3.05%	5.48%	0.020	0.042	15.65%	1.97%	3.51%
		(4.31)	(8.08)			(4.51)	(19.50)			
12/03	2,201	0.088	0.002	0.01%	9.02%	0.065	0.003	0.13%	6.49%	2.53%
		(13.26)	(1.10)			(10.67)	(1.98)			
Means	2,021.17	0.081	0.013	5.07%	9.45%	0.061	0.018	8.17%	6.10%	3.35%
t-Statistics		(9.43)	(3.80)		(13.60)	(8.90)	(4.10)		(8.90)	(15.07)

Table 3: Continued

Panel B: Estimates of expected rate of return based on future realized earnings

$$\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

	Perfect foresight earnings forecasts				Analysts' Forecasts Less Perfect Foresight	Current Accounting Data Less Perfect Foresight
t	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$		
12/92	0.034	0.029	9.61%	6.22%	2.82%	-1.46%
	(5.65)	(12.89)				
12/93	0.053	0.021	5.21%	7.42%	2.53%	-1.11%
	(8.11)	(9.64)				
12/94	0.060	0.022	3.84%	8.14%	2.75%	-2.02%
	(9.24)	(8.83)				
12/95	0.088	0.002	0.03%	9.04%	3.17%	0.02%
	(13.40)	(1.23)				
12/96	0.079	0.001	-0.04%	8.02%	2.80%	-0.18%
	(11.05)	(0.46)				
12/97	0.040	0.004	0.13%	4.43%	5.38%	1.35%
	(4.63)	(2.01)				
12/98	0.055	0.001	-0.02%	5.65%	3.66%	0.30%
	(6.98)	(0.73)				
12/99	0.112	-0.014	8.32%	9.81%	3.23%	-0.07%
	(15.48)	(-13.65)				
12/00	0.037	-0.001	-0.05%	3.65%	5.50%	3.48%
	(4.56)	(-0.34)				
12/01	0.020	0.008	0.49%	2.81%	1.88%	-0.79%
	(2.66)	(3.29)				
12/02	0.004	0.027	3.33%	3.14%	2.34%	-1.17%
	(0.50)	(8.46)				
12/03	0.095	-0.004	0.17%	9.06%	-0.04%	-2.57%
	(12.08)	(-2.19)				
Means	0.056	0.008	2.59%	6.45%	3.00%	-0.35%
t-Statistics	(6.10)	(2.06)		(8.99)	(7.08)	(-0.76)

Table 3: Continued

Panel C: Comparison of implied expected rates of return based on I/B/E/S forecasts of earnings with implied expected rate of return based on current accounting data and on future realized earnings using prices measured the day after the consensus forecast

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

Analysts' consensus earnings forecasts

	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$
Means	2,019.92	0.079	0.014	5.37%	9.30%
t-Statistics		(8.90)	(4.15)		(12.82)

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p'_{jt} - bps^*_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

Current accounting data

	N	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$
Means	2,019.92	0.059	0.019	8.29%	5.91%
t-Statistics		(8.93)	(4.64)		(8.93)

$$\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

Perfect foresight earnings forecasts

	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$
Means	2,019.92	0.054	0.009	2.55%	6.23%
t-Statistics		(5.90)	(2.53)		(8.41)

Notes to Table 3:

Panel A of the table reports the results of estimating regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data cross-sectionally using all available observations. Panel B reports the results of estimating regression (4) using subsequent earnings realizations as perfect foresight forecasts. Observations with any of the dependent or independent variables in the top and bottom one percent observations are removed to reduce the effects of outliers. The variables are as defined in the notes to Tables 1 and 2. Summary means across the annual regressions and the related Fama and MacBeth (1973) t-statistics are provided. The last column of Panel A contains the difference between estimates of expected return from the estimation of regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data. The last two columns of Panel B contain the differences between perfect foresight estimates and the estimates of expected return from the estimation of regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data. Panel C repeats the analysis performed in Panels A and B using an alternative definition of price. Instead of measuring price at trade close the day after the earnings announcement, price is measured at trade close the day following the consensus forecast. This results in a price variable measured 14 days to a month and a half later. All other variables remain unchanged

Table 4: For firms in the S&P 500, comparison of implied expected rates of return based on I/B/E/S forecasts of earnings, based on current accounting data and based on future realizations of earnings

Panel A: Descriptive statistics

	Mean	Median
$\|FE_{jt+1}\|$	0.606	0.250
$\|FE_{jt+1}\|/\ p_{jt}$	0.017	0.007
FE_{jt+1}	-0.286	-0.088
FE_{jt+1}/p_{jt}	-0.008	-0.002
$eps_{jt+1}^{Cons}/bps_{jt}$	0.196	0.169
eps_{jt}/bps_{jt-1}	0.174	0.154
p'_{jt}/bps_{jt}	3.502	2.495
$\left(p'_{jt} - bps^{*}_{jt}\right)/bps_{jt-1}$	2.579	1.596
# of observations	312.58	

Panel B: Estimates of expected rate of return

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

Analysts' consensus earnings forecasts

	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$
Means	312.58	0.058	0.041	67.08%	9.88%
t-Statistics		(7.50)	(15.08)		(16.87)

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p'_{jt} - bps^{*}_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

Current accounting data

	N	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$
Means	312.58	0.084	0.037	59.02%	8.35%
t-Statistics		(11.74)	(13.17)		(11.74)

$$\frac{eps_{jt+1}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

Perfect foresight earnings forecasts

	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$
Means	312.58	0.051	0.037	52.41%	8.83%
t-Statistics		(5.65)	(13.25)		(12.12)

Table 4: Continued

Panel C: Differences in (t-statistics for) estimates of expected rate of return

	Analysts' consensus earnings forecasts	**Current accounting data**
Current accounting data	1.53% (2.71)	
Perfect foresight earnings forecasts	1.05% (2.87)	-0.48% (-0.58)

Notes to Table 4:

The table reports the summary statistics from repeating the analysis performed in Tables 1 to 3 using the sub-sample of firms in the S&P 500 at time *t*.

Table 5: Variation in the implied expected rate of return with changes in the percentage of analysts' making "buy" recommendation – minimum of five analysts following firm

Panel A: Descriptive statistics by percent of buy recommendations

	$90 \leq$ % Buy ≤ 100		$70 \leq$ % Buy ≤ 90		$50 \leq$ % Buy < 70		$30 \leq$ % Buy < 50		$0 \leq$ % Buy < 30	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
$\lvert FE_{jt+1} \rvert$	0.456	0.227	0.897	0.230	0.496	0.218	0.543	0.244	0.540	0.232
$\lvert FE_{jt+1} \rvert / p_{jt}$	0.018	0.008	0.018	0.008	0.019	0.008	0.029	0.010	0.046	0.012
FE_{jt+1}	-0.290	-0.106	-0.690	-0.102	-0.254	-0.086	-0.273	-0.094	-0.287	-0.085
FE_{jt+1}/p_{jt}	-0.011	-0.004	-0.009	-0.003	-0.011	-0.003	-0.018	-0.004	-0.030	-0.004
$eps^{Cons}_{jt+1} / bps_{jt}$	0.126	0.156	0.160	0.161	0.158	0.152	0.132	0.130	0.112	0.111
eps_{jt} / bps_{jt-1}	0.119	0.148	0.150	0.150	0.144	0.140	0.120	0.118	0.093	0.101
p'_{jt} / bps_{jt}	4.012	2.962	3.672	2.717	3.002	2.316	2.466	1.928	2.428	1.660
$\left(p'_{jt} - bps^{*}_{jt}\right) / bps_{jt-1}$	3.773	2.261	3.147	1.963	2.186	1.448	1.613	0.996	1.260	0.716
# of observations	145.91		241.82		276.27		185.09		162.27	

Table 5: Continued

Panel B: Summary of results of estimation by percent of buy recommendations

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p'_{jt} - bps^{*}_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts				Current accounting data			
Recommendation	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$
$90 \leq$ % Buy ≤ 100	145.91	0.125	0.001	9.30%	12.61%	0.099	0.012	17.18%	9.91%
		(7.37)	(0.15)		(9.61)	(4.15)	(1.44)		(4.15)
$70 \leq$ % Buy ≤ 90	241.82	0.094	0.020	14.29%	11.42%	0.092	0.020	20.81%	9.24%
		(7.46)	(6.28)		(11.08)	(6.85)	(4.94)		(6.85)
$50 \leq$ % Buy < 70	276.27	0.077	0.028	31.46%	10.42%	0.086	0.027	30.88%	8.60%
		(10.43)	(13.71)		(15.23)	(16.05)	(15.37)		(16.05)
$30 \leq$ % Buy < 50	185.09	0.047	0.035	24.23%	8.20%	0.063	0.037	29.38%	6.32%
		(4.57)	(10.80)		(9.40)	(9.66)	(10.63)		(9.66)
$0 \leq$ % Buy < 30	162.27	0.023	0.033	35.34%	5.63%	0.040	0.042	34.77%	4.05%
		(0.94)	(3.66)		(3.08)	(4.00)	(11.95)		(4.00)

Table 5: Continued

Panel C: Differences in (t-statistics for) estimates of expected rate of return

		Analysts' expected rate of return					**Expected rate of return based on current accounting data**			
		90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50	0 ≤ % < 30	90 ≤ % ≤ 100	70 ≤ % ≤ 90	50 ≤ % < 70	30 ≤ % < 50
Analysts' expected rate of return	70 ≤ % ≤ 90	1.19% (1.09)								
	50 ≤ % < 70	2.18% (1.64)	0.99% (1.31)							
	30 ≤ % < 50	4.41% (4.86)	3.21% (5.01)	2.22% (3.40)						
	0 ≤ % < 30	6.98% (3.94)	5.78% (3.10)	4.79% (2.96)	2.57% (1.81)					
Expected rate of return based on current accounting data	90 ≤ % ≤ 100	2.70% (1.17)								
	70 ≤ % ≤ 90		2.18% (3.12)				0.67% (0.22)			
	50 ≤ % < 70			1.82% (3.74)			1.30% (0.54)	0.64% (0.67)		
	30 ≤ % < 50				1.89% (4.21)		3.59% (1.62)	2.92% (2.79)	2.29% (4.54)	
	0 ≤ % < 30					1.58% (1.13)	5.86% (2.88)	5.19% (4.42)	4.56% (6.27)	2.27% (3.45)

Table 5: Continued

Notes to Table 5:

Using the median consensus analysts' forecast and the percent of buy recommendations from the summary I/B/E/S database, we estimate expected rate of return by percentage of buy recommendations for all firms with at least five analysts included in the consensus. Panel A reports descriptive statistics by percentage of buy recommendations. The variables are as defined in the notes to Tables 1 and 2. Panel B reports the results of estimating regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data cross-sectionally using all available observations of that percentage of buy recommendations. Within the percentage of buy recommendations, observations with any of the dependent or independent variables in the top and bottom one percent observations are removed to reduce the effects of outliers. The reported numbers are the summary means across the annual regressions and the related Fama and Macbeth (1973) t-statistics. The last column for each regression in Panel B reports the annual estimates of expected rate of return by percentage of buy recommendations. Panel C reports summary means of the differences in estimates across the annual regressions and the related Fama and Macbeth (1973) t-statistics.

Table 6: Variation in the implied expected rate of return with changes in the percentage of analysts' making "buy" recommendation – S&P 500 firms with a minimum of five analysts following firm

Panel A: Descriptive statistics by percent of buy recommendations

	70 ≤ % Buy ≤ 100		50 ≤ % Buy ≤ 70		30 ≤ % Buy < 50		0 ≤ % Buy < 30	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
$\lvert FE_{jt+1}\rvert$	0.611	0.224	0.557	0.230	0.604	0.282	0.575	0.229
$\lvert FE_{jt+1}\rvert / p_{jt}$	0.012	0.005	0.012	0.006	0.016	0.008	0.024	0.008
FE_{jt+1}	-0.347	-0.084	-0.252	-0.095	-0.222	-0.084	-0.274	-0.071
FE_{jt+1}/p_{jt}	-0.006	-0.002	-0.005	-0.002	-0.006	-0.002	-0.014	-0.002
$eps^{Cons}_{jt+1} / bps_{jt}$	0.225	0.202	0.208	0.177	0.190	0.154	0.221	0.139
eps_{jt} / bps_{jt-1}	0.212	0.187	0.187	0.165	0.177	0.145	0.165	0.128
p'_{jt} / bps_{jt}	4.361	3.322	3.725	2.669	3.175	2.224	3.522	1.930
$\left(p'_{jt} - bps^{*}_{jt}\right) / bps_{jt-1}$	3.840	2.444	2.799	1.831	2.320	1.301	2.067	1.026
# of observations	75.64		100.00		72.36		52.00	

Table 6: Continued

Panel B: Summary of results of estimation by percent of buy recommendations

$$\frac{eps_{jt+1}^{Cons}}{bps_{jt}} = \gamma_0 + \gamma_1 \frac{p'_{jt}}{bps_{jt}} + \mu_{jt} \quad (4)$$

$$\frac{eps_{jt}}{bps_{jt-1}} = \delta_0 + \delta_1 \frac{p'_{jt} - bps^{*}_{jt}}{bps_{jt-1}} + \zeta_{jt} \quad (5)$$

		Analysts' consensus earnings forecasts				**Current accounting data**			
Recommendation	N	γ_0	γ_1	Adj R^2	$\hat{r} = \gamma_0 + \gamma_1$	δ_0	δ_1	Adj R^2	$\hat{r} = \delta_0$
$70 \leq$ % Buy ≤ 100	75.64	0.091	0.033	53.10%	12.35%	0.110	0.028	45.05%	10.99%
		(8.30)	(9.19)		(14.66)	(12.05)	(7.30)		(12.05)
$50 \leq$ % Buy ≤ 70	100.00	0.074	0.037	63.45%	11.06%	0.098	0.033	59.80%	9.80%
		(7.28)	(11.01)		(14.72)	(13.13)	(10.55)		(13.13)
$30 \leq$ % Buy < 50	72.36	0.031	0.052	67.96%	8.25%	0.066	0.049	65.66%	6.55%
		(2.70)	(9.18)		(11.17)	(8.59)	(12.69)		(8.59)
$0 \leq$ % Buy < 30	52.00	0.023	0.052	72.18%	7.48%	0.070	0.046	58.02%	7.01%
		(2.42)	(14.18)		(11.81)	(10.18)	(14.64)		(10.18)

Table 6: Continued

Panel C: Differences in (t-statistics for) estimates of expected rate of return

		Analysts' expected rate of return				**Expected rate of return based on current accounting data**		
		70 ≤ % ≤ 100	50 ≤ % ≤ 70	30 ≤ % < 50	0 ≤ % < 30	70 ≤ % ≤ 100	50 ≤ % ≤ 70	30 ≤ % < 50
Analysts' expected rate of return	50 ≤ % ≤ 70	1.29% (1.58)						
	30 ≤ % < 50	4.09% (3.27)	2.80% (2.97)					
	0 ≤ % < 30	4.87% (5.08)	3.58% (4.55)	0.77% (0.95)				
Expected rate of return based on current accounting data	70 ≤ % ≤ 100	1.36% (1.40)						
	50 ≤ % ≤ 70		1.25% (1.84)			1.19% (1.29)		
	30 ≤ % < 50			1.70% (4.95)		4.44% (4.30)	3.25% (3.06)	
	0 ≤ % < 30				0.47% (0.77)	3.98% (4.70)	2.79% (3.40)	-0.46% (-0.50)

Table 6: Continued

Notes to Table 6:

Using the median consensus analysts' forecast and the percent of buy recommendations from the summary I/B/E/S database, we estimate expected rate of return by percentage of buy recommendations for firms in the S&P 500. Panel A reports descriptive statistics by percentage of buy recommendations. The variables are as defined in the notes to Tables 1 and 2. Panel B reports the results of estimating regression (4) using I/B/E/S consensus forecasts and regression (5) using current accounting data cross-sectionally using all available observations in the S&P 500 of that percentage of buy recommendations. Within the percentage of buy recommendations, observations with any of the dependent or independent variables in the top and bottom one percent observations are removed to reduce the effects of outliers. The reported numbers are the summary means across the annual regressions and the related Fama and Macbeth (1973) t-statistics. The last column of each method in Panel B reports the annual estimates of expected rate of return for each of the methods by percentage of buy recommendations. Panel C reports summary means of the differences in estimates across the annual regressions and the related Fama and Macbeth (1973) t-statistics.

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